Service & Adjustment Specifications

INTRODUCTION

Use this article to quickly find specifications related to servicing and on-vehicle adjustments. This is a quick-reference article to use when you are familiar with an adjustment procedure and only need a specification.

CAPACITIES

CAUTION: Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly and components may be damaged when using a fluid not specified by VW. VW does not recommend changing fluids on some components, these are footnoted in CAPACITIES tables.

CAUTION: Some transaxles require differential to be filled separately. See appropriate FLUID CAPACITIES table.

BEETLE FLUID CAPACITIES

Application	(1)(2) Quantity
Automatic Transaxle	
01M (VW ATF G 052 162A) (3)	
Drain & Refill	3.2 Qts. (3.0L)
Dry Fill	5.6 Qts. (5.3L)
Tiptronic 09A (VW ATF G 052 990A) (3)(4)	
Drain & Refill	2.6 Qts. (2.5L)
Dry Fill	7.4 Qts. (7.0L)
Cooling System (Includes Heater) (5)	
1.8L Turbo	5.3 Qts. (5.0L)
1.9L Turbo Diesel	6.3 Qts. (6.0L)
2.0L	5.3 Qts. (5.0L)
Crankcase (Includes Filter) (6)	
1.8L Turbo (7)	4.6Qts. (4.35L)
1.9L Turbo Diesel (8)	4.8 Qts. (4.5L)
2.0L (7)	4.4Qts. (4.2L)
Differential	
With 01M Transaxle (SAE 75W-90 G 052 145 S Synthetic Oil)	(3) .80 Qt. (.75L)

With Tiptronic 09A Transaxle	(3)(4)
Manual Transaxle 02J (SAE 75W-90 G50 Synthetic Oil) (9)	2.1 Qts. (2.0L)
Manual Transaxle 02M (SAE 75W-90 G51 Synthetic Oil) (9)	2.4 Qts. (2.3L)
Power Steering Fluid (Hydraulic Oil G 002 000)	.75 Qt. (.71L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Differential is serviced through A/T drain plug and A/T fill tube. Differential and A/T share a common fluid sump area.

(5) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(6) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(7) Use an API SJ energy conserving engine oil.

(8) Use an API 5W30 synthetic or heavy duty engine oil CF4 or CG4 for diesel engines. After changing oil, start engine and run at idle. DO NOT rev engine. To do so could cause damage to turbocharger.

(9) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

CABRIO FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle (VW ATF G 052 162A) (3)	
Drain & Refill	3.2 Qts. (3.0L)
Dry Fill	5.6 Qts. (5.3L)
Cooling System (Includes Heater) (4)	5.3 Qts. (5.0L)
Crankcase (Includes Filter) (5)(6)	4.2 Qts. (4.0L)
Differential (SAE 75W-90 G 052 145S Synthetic Oil)	(3) .80 Qt. (.75L)
Manual Transaxle (SAE 75W-90 G50 Synthetic Oil) (7)	2.1 Qts. (2.0L)
Power Steering Fluid (Use Only Hydraulic Oil G002 000)	.95 Qt. (.90L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(5) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(6) Use an API SJ energy conserving engine oil.

(7) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

EUROVAN FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle 01P (VW ATF G 052 162A)	
Drain & Refill	3.7 Qts. (3.5L)
Dry Fill	5.65 Qts. (5.35L)
Cooling System (Includes Heater) (3)	
Front Heater Only	9.5 Qts. (9.0L)
Front & Rear Heater With Water Heater	17.8 Qts. (16.8L)
Front & Rear Heater Without Water Heater	12 Qts. (11.4L)
Crankcase (Includes Filter) (4)(5)	6.3 Qts. (6.0L)
Differential With A/T 01P (SAE 75W-90 G 052 145S Synthetic Oil)	(6) 1.2 Qt. (1.1L)
Power Steering Fluid (Use Only Hydraulic Oil G 002 000)	1.1 Qt. (1.0L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(4) When changing engine oil, add approximately .5 Qt. (.4L) less than specification

listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(5) Use an API SJ energy conserving engine oil.

(6) Dry fill capacity given. No oil change is required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

GOLF FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle (VW ATF G 052 162A) (3)	
Drain & Refill	3.2 Qts. (3.0L)
Dry Fill	5.6 Qts. (5.3L)
Cooling System (Includes Heater) (4)	
1.8L Turbo	5.3 Qts. (5.0L)
1.9L Turbo Diesel	6.3 Qts. (6.0L)
2.0L	5.3 Qts. (5.0L)
Crankcase (Includes Filter) (5)	
1.8L (6)	4.6 Qts. (4.4L)
1.9L Turbo Diesel (7)	4.8 Qts. (4.5L)
2.0L (6)	4.2 Qts. (4.0L)
Differential (SAE 75W-90 G 052 145 S Synthetic Oil)	(3) .80 Qt. (.75L)
Manual Transaxle (SAE 75W-90 G50 Synthetic Oil) (8)	2.1 Qts. (2.0L)
Power Steering Fluid (Use Only Hydraulic Oil G 002 000)	.95 Qt. (.90L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(5) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(6) Use an API SJ energy conserving engine oil.

(7) Use an API 5W30 synthetic or heavy duty engine oil CF4 or CG4 for diesel engines. After changing oil , start engine and run at idle. DO NOT rev engine. To do so could cause damage to turbocharger.

(8) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

GTI FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle	
01M (VW ATF G 052 162A) (3)	
Drain & Refill	3.2 Qts. (3.0L)
Dry Fill	5.6 Qts. (5.3L)
Tiptronic 09A (VW ATF G 052 990A) (3)(4)	
Drain & Refill	2.6 Qts. (2.5L)
Dry Fill	7.4 Qts. (7.0L)
Cooling System (Includes Heater) (5)	
1.8L Turbo	5.3 Qts. (5.0L)
2.0L	5.3 Qts. (5.0L)
2.8L	9.5 Qts. (9.0L)
Crankcase (Includes Filter) (6)	
1.8L Turbo (7)	4.7 Qts. (4.5L)
2.0L (7)	4.2 Qts. (4.0L)
2.8L (7)	6.4 Qts. (6.1L)
Differential	
With 01M Transaxle (SAE 75W-90 G 052 145 S Synthetic Oil)	(3) .80 Qt. (.75L)
With Tiptronic 09A Transaxle	(3)(4)
Manual Transaxle 02J (SAE 75W-90 G50 Synthetic Oil) (8)	2.1 Qts. (2.0L)
Power Steering Fluid (Hydraulic Oil G 002 000)	.95 Qt. (.90L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Differential is serviced through A/T drain plug and fill tube. Differential and A/T share a common fluid sump area.

(5) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(6) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(7) Use an API SJ energy conserving engine oil.

(8) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

JETTA FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle	
01M (VW ATF G 052 162A) (3)	
Drain & Refill	3.2 Qts. (3.0L)
Dry Fill	5.6 Qts. (5.3L)
Tiptronic 09A (VW ATF G052 990A) (3)(5)	
Drain & Refill	2.6 Qts. (2.5L)
Dry Fill	7.4 Qts. (7.0L)
Cooling System (Includes Heater) (4)	
1.8L Turbo	5.3 Qts. (5.0L)
1.9L Turbo Diesel	6.3 Qts. (6.0L)
2.0L	5.3 Qts. (5.0L)
2.8L	9.5 Qts. (9.0L)
Crankcase (Includes Filter) (6)	
1.8L Turbo (7)	4.6 Qts. (4.4L)
1.9L Turbo Diesel (8)	4.8 Qts. (4.5L)
2.0L (7)	4.2 Qts. (4.0L)
2.8L (7)	6.1 Qts. (5.8L)
Differential	
With 01M Transaxle (SAE 75W-90 G 052 145 S Synthetic Oil)	(3) .80 Qts. (.75L)
With Tiptronic 09A Transaxle	(3)(5)
Manual Transaxle (SAE 75W-90 G50 Synthetic Oil) (9)	2.1 Qts. (2.0L)
Power Steering Fluid (Use Only Hydraulic Oil G 002 000)	.95 Qt. (.90L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(5) Differential is serviced through A/T drain plug and fill tube. Differential and A/T share a common sump area.

(6) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm coolant to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(7) Use an API SJ energy conserving engine oil.

(8) Use an API 5W30 synthetic or heavy duty engine oil CF4 or CG4 for diesel engines. After changing oil, start engine and run at idle. DO NOT rev engine. To do so could cause damage to turbocharger.

(9) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

PASSAT FLUID CAPACITIES

Application	**(1)(2) Quantity**
Automatic Transaxle (VW ATF G 052 162A) (3)	
Drain & Refill	2.7 Qts. (2.5L)
Dry Fill	9.5 Qts. (9.0L)
Cooling System (Includes Heater) (4)	
1.8L Turbo	7.4 Qts. (7.0L)
2.8L	8.5 Qts. (8.0L)
Crankcase (Includes Filter) (5)	
1.8L Turbo (6)	3.9 Qts. (3.7L)
2.8L (6)	6.5 Qts. (6.2L)
Differential	
Front (SAE 75W-90) (G 052 145 S Synthetic Oil)	(3) .80 Qt. (.75L)
Rear (SAE 90 GL5) (MIL-L2105B Hypoid Transmission Oil)	(3) 1.6 Qt. (1.5L)
Manual Transaxle (SAE 75W-90) (G 052 911A Synthetic	2.4 Qts. (2.2L)

Oil) (7)	
Power Steering Fluid (Use Only Hydraulic Oil G 002 000)	1.0 Qt. (.9L)
Transfer Case (SAE 75W-90 G 052 145 S Synthetic Oil)	(3) .85 Qt. (.8L)

(1) Approximate quantity is listed.

(2) Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components, as noted in table.

(3) No fluid change required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Only use coolant G 12, meeting specification TL VW 774 D. Identifiable by Red color.

(5) When changing engine oil, add approximately .5 Qt. (.4L) less than specification listed. Start engine and warm to 140°F (60°C). Shut engine off. Wait 3 minutes and recheck fluid level. Add engine oil as necessary. DO NOT overfill, as overfilling may cause catalytic converter damage and misfire diagnostic trouble code to be set.

(6) Use an API SJ energy conserving engine oil.

(7) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

QUICK-SERVICE

SERVICE INTERVALS & SPECIFICATIONS

CAUTION: Use only VW recommended fluids. DO NOT use any other fluids. Components may not function properly when using a fluid not specified by VW and components may be damaged. VW does not recommend changing fluids on some components. See CAPACITIES for VW fluid specifications.

CAUTION: For model year 2001 only, on 1.9L Turbo Diesel, manufacturer recommends replacing camshaft timing belt at 40,000, 60,000, 80,000 and 105,000 miles.

REPLACEMENT INTERVALS (BEETLE)

Component	Months	Miles
Air Filter	48	40,000
Automatic Transaxle Fluid	(1)	(1)
Brake Fluid	24	(2)
Camshaft Timing Belt		

1.8L Turbo	(2)	(3) 105,000
1.9L Turbo Diesel (4)(5)	(2)	(6) 60,000
2.0L	(2)	(3) 105,000
Camshaft Timing Belt Tensioner Bearing		
1.8L Turbo	(2)	105,000
1.9L Turbo Diesel (4)(5)	(2)	(6) 60,000
2.0L	(2)	105,000
Coolant	(7)	(7)
Diesel Fuel Water Separator (8)		
1.9L Turbo Diesel	12	10,000
Differential (Automatic Transaxle)	(1)	(1)
Drive Belts		
Ribbed (Serpentine) Belt	(2)	(9)
V Belt		
Except 1.8L Turbo	(2)	(9)
1.8L Turbo	(2)	80,000
Dust & Pollen Filter For Passenger Compartment	(2)	20,000
Engine Oil & Filter (10)		
1.8L Turbo	12	5000
1.9L Turbo Diesel	12	10,000
2.0L	12	10,000
Fuel Filter		
1.9L Turbo Diesel	(2)	20,000
Manual Transaxle Fluid	(11)	(11)
Spark Plugs	(2)	40,000

(1) No fluid change is required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(2) Service interval is not available from manufacturer.

(3) On 1.8L Turbo and 2.0L manufacturer recommends checking camshaft timing belt condition at 60,000 and 80,000 miles.

(4) For model year 2001 only, on 1.9L Turbo Diesel, manufacturer recommends replacing camshaft timing belt at 40,000, 60,000, 80,000 and 105,000 miles.

(5) In model year 2002, 1.9L Turbo Diesel camshaft timing belt and tensioner should be checked at 40,000 miles and replaced at 80,000 miles.

(6) On 1.9L Turbo Diesel, check camshaft timing belt and tensioner at 40,000 miles.

(7) Service interval is not available from manufacturer. Check for leaks and check fluid level at 20,000 mile intervals. Add fluid as necessary.

(8) Water separator should first be drained at 5000 miles and at scheduled interval thereafter.

(9) Check drive belts at 40,000 mile intervals. Adjust or replace as necessary.

(10) First engine oil and filter change should be performed at 5000 miles and at 10,000 miles, and at scheduled interval thereafter.

(11) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

REPLACEMENT INTERVALS (CABRIO, GOLF, GTI & JETTA)

Component	Months	Miles
Air Filter	48	40,000
Automatic Transaxle Fluid	(1)	(1)
Brake Fluid	24	(2)
Camshaft Timing Belt		
1.8L Turbo	(2)	(3) 105,000
1.9L Turbo Diesel (4)(5)	(2)	(6) 60,000
2.0L	(2)	(3) 105,000
Camshaft Timing Belt Tensioner Bearing		
1.8L Turbo	(2)	105,000
1.9L Turbo Diesel (4)(5)	(2)	(6) 60,000
2.0L	(2)	105,000
Coolant	(7)	(7)
Diesel Fuel Water Separator (8)		
1.9L Turbo Diesel	12	10,000
Differential (Automatic Transaxle)	(1)	(1)
Drive Belts		
Ribbed (Serpentine) Belt	(2)	(9)
V Belt		
Except 1.8L Turbo	(2)	(9)
1.8L Turbo	(2)	80,000
Dust & Pollen Filter For Passenger Compartment	(2)	20,000
Engine Oil & Filter (10)		
1.8L Turbo	12	5000
1.9L Turbo Diesel, 2.0L & 2.8L VR6	12	10,000

Fuel Filter		
1.9L Turbo Diesel	(2)	20,000
Manual Transaxle Fluid	(11)	(11)
Spark Plugs	(2)	40,000
Spark Plugs (Cabrio)	(2)	20,000

(1) No fluid change is required, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(2) Service interval is not available from manufacturer.

(3) On 1.8L Turbo and 2.0L manufacturer recommends checking camshaft timing belt condition at 60,000 and 80,000 miles.

(4) For model year 2001 only, on 1.9L Turbo Diesel, manufacturer recommends replacing camshaft timing belt at 40,000, 60,000, 80,000 and 105,000 miles and camshaft timing belt tensioner at 40,000, 60,000 and 80,000 miles.

(5) On model year 2002, 1.9L Turbo Diesel camshaft timing belt and tensioner should be checked at 40,000 miles and replaced at 80,000 miles.

(6) On 1.9L Turbo Diesel, check camshaft timing belt and tensioner at 40,000 miles.

(7) Service interval is not available from manufacturer. Check for leaks and check fluid level at 20,000 mile intervals. Add fluid as necessary.

(8) Water separator should first be drained at 5000 miles and at scheduled interval thereafter.

(9) Check drive belts at 40,000 mile intervals. Adjust or replace as necessary.

(10) First engine oil and filter change should be performed at 5000 miles and at 10,000 miles, and at scheduled interval thereafter.

(11) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

REPLACEMENT INTERVALS (EUROVAN)

Component	**Months**	**Miles**
Air Filter	24	20,000
Automatic Transaxle Fluid	(1)	40,000
Brake Fluid	24	(1)
Coolant	(2)	(2)
Differential (Automatic Transaxle)	(3)	(3)
Drive Belts		
Ribbed (Serpentine) Belt	(1)	(4)
V Belt	(1)	(4)
Dust & Pollen Filter For Passenger Compartment	(1)	20,000

Engine Oil & Filter (5)	12	10,000
Spark Plugs	(1)	40,000

(1) Service interval is not available from manufacturer.

(2) Service interval is not available from manufacturer. Check for leaks and check fluid level at 20,000 mile intervals. Add fluid as necessary.

(3) No fluid change is necessary, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(4) Check drive belts at 40,000 mile intervals. Adjust or replace as necessary.

(5) First engine oil and filter change should be performed at 5000 miles and at 10,000 miles, and at scheduled interval thereafter.

REPLACEMENT INTERVALS (PASSAT)

Component	Months	Miles
Air Filter	24	20,000
Automatic Transaxle Fluid	(1)	(1)
Brake Fluid	24	(2)
Camshaft Timing Belt		
1.8L Turbo & 2.8L V6	(2)	105,000
Camshaft Timing Belt Tensioner		
1.8L Turbo & 2.8L V6	(2)	105,000
Coolant	(3)	(3)
Differential Front & Rear (Automatic Transaxle)	(1)	(1)
Drive Belts		
Ribbed (Serpentine) Belt	(2)	(4)
V Belt		
Except 1.8L Turbo	(2)	(4)
1.8L Turbo	(2)	80,000
Dust & Pollen Filter For Passenger Compartment	(2)	20,000
Engine Oil & Filter (5)	(2)	5000
Manual Transaxle Fluid	(6)	(6)
Spark Plugs	(2)	40,000
Transfer Case	(1)	(1)

(1) No fluid change is necessary, as it is filled for life. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

(2) Service interval is not available from manufacturer.

(3) Service interval is not available from manufacturer. Check for leaks and check fluid level at 20,000 mile intervals. Add fluid as necessary.

(4) Check drive belts at 40,000 mile intervals. Adjust or replace as necessary.

(5) First engine oil and filter change should be performed at 5000 miles and at 10,000 miles, and then at scheduled interval thereafter.

(6) Service interval is not available from manufacturer. Check for leaks and check fluid level at 40,000 mile intervals. Add fluid as necessary.

BELT ADJUSTMENT (1)

Application	Specification
Beetle 1.8L Turbo, 1.9L Turbo Diesel, 2.0L & 2.8L	(2)
Cabrio 2.0L	
Generator & A/C	(2)
Power Steering	(3)
EuroVan 2.8L	(2)
Golf 1.8L Turbo, 1.9L Turbo Diesel & 2.0L	(2)
GTI 1.8L Turbo, 2.0L & 2.8L	(2)
Jetta 1.8L Turbo, 1.9L Turbo Diesel, 2.0L & 2.8L	(2)
Passat	
1.8L A/C	(4)
1.8L Generator & Power Steering	(2)
1.8L Water Pump	(5)
2.8L	(2)

(1) Check drive belts at 40,000 mile intervals. Adjust or replace as necessary.

(2) Automatic belt tensioner is used. Adjustment is not required.

(3) Belt deflection on NEW belt is not available from manufacturer. Belt deflection on used belt should be .200" (5.00 mm).

(4) With belt tensioner bolts lose. Use torque wrench on integral tensioner bolt head. On engine code ATW tension belt to 18 ft lbs (25 Nm). On engine codes AUG and AWM tension belt to 22 ft lbs (30 Nm). Tighten tensioner fastener bolts to 15 ft lbs (20 Nm).

(5) V belt has no adjustment. Belt is only used on engine code ATW.

MECHANICAL CHECKS

ENGINE COMPRESSION

WARNING: Fuel pump fuse must be removed and ignition coil electrical harness connector(s) disconnected before performing compression check.

Gasoline Engines

Check compression with fuel pump fuse removed. Disconnect ignition coil electrical harness connector(s). Engine at operating temperature and fully charged battery. See **COMPRESSION SPECIFICATIONS** table.

Diesel Engines

WARNING: Disconnect 10-pin fuel cut-off valve electrical connector (located on diesel injection pump) before performing compression check.

Check compression with 10-pin fuel cut-off valve electrical harness connector disconnected (located on diesel injection pump). Using a compression gauge capable of reading up to 600 psi (41 bar). Engine at operating temperature and a fully charged battery. See **COMPRESSION SPECIFICATIONS** table.

COMPRESSION SPECIFICATIONS

Application	(1) Specification
Normal Compression Pressure	
Beetle	
1.8L Turbo (2)	145-203 psi (10-14 bar)
1.9L Turbo Diesel	363-450 psi (25.0-31.0 bar)
2.0L (2)	145-189 psi (10-13 bar)
Cabrio 2.0L (3)	145-189 psi (10.0-13.0 bar)
EuroVan 2.8L (3)	145-189 psi (10.0-13.0 bar)
Golf	
1.8L Turbo (2)	145-203 psi (10.0-14.0 bar)
1.9L Turbo Diesel	363-450 psi (25.0-31.0 bar)
2.0L (2)	145-189 psi (10.0-13.0 bar)
GTI	
1.8L (2)	145-203 psi (10.0-14.0 bar)
2.0L & 2.8L (2)	145-189 psi (10.0-13.0 bar)
Jetta	
1.8L Turbo (2)	145-203 psi (10.0-14.0 bar)
1.9L Turbo Diesel	363-450 psi (25.0-31.0 bar)
2.0L & 2.8L (2)	145-189 psi (10.0-13.0 bar)
Passat	
1.8L Turbo (ATW) (2)	145-189 psi (10.0-13.0 bar)

1.8L Turbo (AUG & AWM) (2)	145-203 psi (10.0-14.0 bar)
2.8L (4)	131-203 psi (9.0-14.0 bar)
Minimum Compression Pressure	
Beetle	
1.8L	101 psi (7.0 bar)
1.9L Turbo Diesel	276 psi (19.0 bar)
2.0L	109 psi (7.5 bar)
Cabrio 2.0L	109 psi (7.5 bar)
EuroVan 2.8L	109 psi (7.5 bar)
Golf	
1.8L Turbo	101 psi (7.0 bar)
1.9L Turbo Diesel	276 psi (19.0 bar)
2.0L	109 psi (7.5 bar)
GTI	
1.8L Turbo	101 psi (7.0 bar)
2.0L & 2.8L	109 psi (7.5 bar)
Jetta	
1.8L Turbo	101 psi (7.0 bar)
1.9L Turbo Diesel	276 psi (19.0 bar)
2.0L & 2.8L	109 psi (7.5 bar)
Passat	
1.8L Turbo	101 psi (7.0 bar)
2.8L Turbo	109 psi (7.5 bar)
Maximum Variation Between Cylinders	
1.8 Turbo, 2.0L, 2.8L VR6 & 2.8L V6	44 psi (3.0 bar)
1.9L Turbo Diesel	73 psi (5.0 bar)

(1) Operate starter until tester shows no further increase.

(2) On all models (except 2.0L Cabrio), with 1.8L turbo engine and 2.0L engine, remove fuel pump fuse No. 32. On GTI and Jetta with 2.8L engine, remove fuel pump fuse No. 32.

(3) On Cabrio and EuroVan, remove fuel pump fuse No. 18.

(4) On Passat with 2.8L engine, remove fuel pump fuse No. 28.

VALVE CLEARANCE

NOTE: All engines are equipped with hydraulic valve lifters. No adjustments are required.

IGNITION SYSTEM

IGNITION COIL

IGNITION COIL RESISTANCE-Ohms

Application	Primary	Secondary
Beetle		
1.8L Turbo	(1)	(2)
2.0L (AEG)	(1)	(3) 4000-6000
2.0L (AVH & AZG)	(1)	(2)
Cabrio 2.0L	.5-1.5	2500-4000
EuroVan		
2.8L (AES)	(1)	3600-4400
2.8L (AXK)	(1)	(2)
Golf		
1.8L Turbo	(1)	(2)
2.0L	(1)	(3) 4000-6000
GTI		
1.8L Turbo	(1)	(2)
2.0L	(1)	(3) 4000-6000
2.8L	(1)	(4) 3600-4400
Jetta		
1.8L Turbo	(1)	(2)
2.0L (AEG)	(1)	(3) 4000-6000
2.0L (AVH & AZG)	(1)	(2)
2.8L	(1)	(4) 3600-4400
Passat		
1.8L Turbo	(1)	(2)
2.8L (ATQ)	(1)	8000-14,000
2.8L (ATQ)	(1)	(5) 18,000-25,000

(1) Primary ignition coil resistance cannot be measured.

(2) Ignition coil specifications not available from manufacturer.

(3) Check resistance at number 4 terminal (at rounded end of electrical receptacle) and coil outlets for cylinders 1-4 and 2-3.

(4) Check resistance at coil outlets for cylinders 1-6, 3-4 and 2-5. See **Fig. 5** .

(5) Manufacturer recommends measuring resistance between two spark plug wires, still connected to ignition coil. See **Fig. 4** .

HIGH TENSION WIRE RESISTANCE

HIGH TENSION WIRE RESISTANCE

Application	Ohms
Beetle	
1.8L Turbo	(1)
2.0L	(2) 4000-8000
Cabrio 2.0L	(2) 4800-7200
EuroVan	
2.8L (AES)	(2) 4600-7200
2.8L (AXK)	(1)
Golf	
1.8L Turbo	(1)
2.0L	(2) 4000-8000
GTI & Jetta	
1.8L Turbo	(1)
2.0L	(2) 4000-8000
2.8L	(2) 4000-6000
Passat	
1.8L Turbo	(1)
2.8L	(2) 3000-7000
2.8L	(3) 18,000-25,000

(1) No high tension wires are used as ignition coil on spark plug type ignition system is used.

(2) Resistance listed with spark plug connector installed on end of high tension wire and suppressor installed on ignition coil end of high tension wire.

(3) Manufacturer recommends measuring resistance between two spark plug wires, still connected to ignition coil. See **Fig. 4** .

SPARK PLUGS

SPARK PLUG TYPE

Application	NGK No.
Beetle	
1.8L Turbo	PFR6Q

2.0L (AEG)	BKUR6ET-10
2.0L (AVH & AZG)	PZFR5D-11
Cabrio 2.0L	FR8DS
EuroVan	
2.8L (AES)	BKR5EKUP
2.8L (AXK)	PZFR5D-11
Golf	
1.8L Turbo	PFR6Q
2.0L	BKUR6ET-10
GTI	
1.8L Turbo	PFR6Q
2.0L	BKUR6ET-10
2.8L	BKR5EKUP
Jetta	
1.8L Turbo	PFR6Q
2.0L (AEG)	BKUR6ET-10
2.0L (AVH & AZG)	PZFR5D-11
2.8L (AFP)	BKR5EKUP
Passat	
1.8L Turbo	PFR6Q
2.8L	BKR6EKUB

SPARK PLUG SPECIFICATIONS

Application	Gap In. (mm)	Torque Ft. Lbs. (Nm)
Beetle		
1.8L Turbo	0.32 (.80)	22 (30)
2.0L	.035-.043 (.90-1.10)	22 (30)
Cabrio 2.0L	.032 (.80)	22 (30)
EuroVan		
2.8L (AES)	(1) .028 (.70)	22 (30)
2.8L (AXK)	.035-.043 (.90-1.10)	22 (30)
Golf		
1.8L Turbo	.032 (.80)	22 (30)
2.0L	.035-.043 (.90-1.10)	22 (30)
GTI		
1.8L Turbo	.032 (.80)	22 (30)
2.0L	.035-.043 (.90-1.10)	22 (30)
2.8L	(1) .028 (.70)	18 (25)
Jetta		

1.8L Turbo	.032 (.80)	22 (30)
2.0L	.035-.043 (.90-1.10)	22 (30)
2.8L	(1) .028 (.70)	18 (25)
Passat		
1.8L Turbo	.032 (.80)	22 (30)
2.8L	.024 (.60)	22 (30)
(1) Gap is between ground electrode and center electrode insulator.		

FIRING ORDER

FIRING ORDER

Application	Firing Order
Beetle	
1.8L Turbo	(1) 1-3-4-2
1.9L Turbo Diesel	(2) 1-3-4-2
2.0L (AEG)	(3) 1-3-4-2
2.0L (AVH & AZG)	(4) 1-3-4-2
Cabrio 2.0L	(2) 1-3-4-2
EuroVan	
2.8L (AES)	(5) 1-5-3-6-2-4
2.8L (AXK)	(5) 1-5-3-6-2-4
Golf	
1.8L Turbo	(1) 1-3-4-2
1.9L Turbo Diesel	(2) 1-3-4-2
2.0L (AEG)	(3) 1-3-4-2
GTI	
1.8L Turbo	(1) 1-3-4-2
2.0L	(3) 1-3-4-2
2.8L	(5) 1-5-3-6-2-4
Jetta	
1.8L Turbo	(1) 1-3-4-2
1.9L Turbo Diesel	(2) 1-3-4-2
2.0L (AEG)	(3) 1-3-4-2
2.0L (AVH & AZG)	(4) 1-3-4-2
2.8L (AFP)	(5) 1-5-3-6-2-4

Passat	
1.8L Turbo	(1) 1-3-4-2
2.8L	(6) 1-4-3-6-2-5

(1) Ignition coil on spark plug type ignition system is used. Cylinder No. 1 is at timing belt end of engine and cylinder No. 4 is at flywheel end of engine.

(2) Cylinder No. 1 is located at timing belt end of engine. Cylinder No. 4 is located at flywheel end of engine.

(3) System uses a Distributorless Ignition System (DIS) with 2 ignition coils in one ignition coil assembly. Cylinders No. 1 and 4 use the same ignition coil. Cylinders No. 2 and 3 use the same ignition coil. See **Fig. 1** . Cylinder No. 1 is located at timing belt end of engine. Cylinder No. 4 is located at flywheel end of engine.

(4) System uses a Distributorless Ignition System (DIS) with one ignition coil assembly. See **Fig. 2** for cylinder No. to coil identification. Cylinder No. 1 is located at timing belt end of engine. Cylinder No. 4 is located at flywheel end of engine.

(5) System uses a Distributorless Ignition System (DIS) with one ignition coil assembly. See **Fig. 5** for ignition coil and cylinder number identification.

(6) System uses a Distributorless Ignition System (DIS) with one ignition coil. See **Fig. 6** for cylinder number identification.

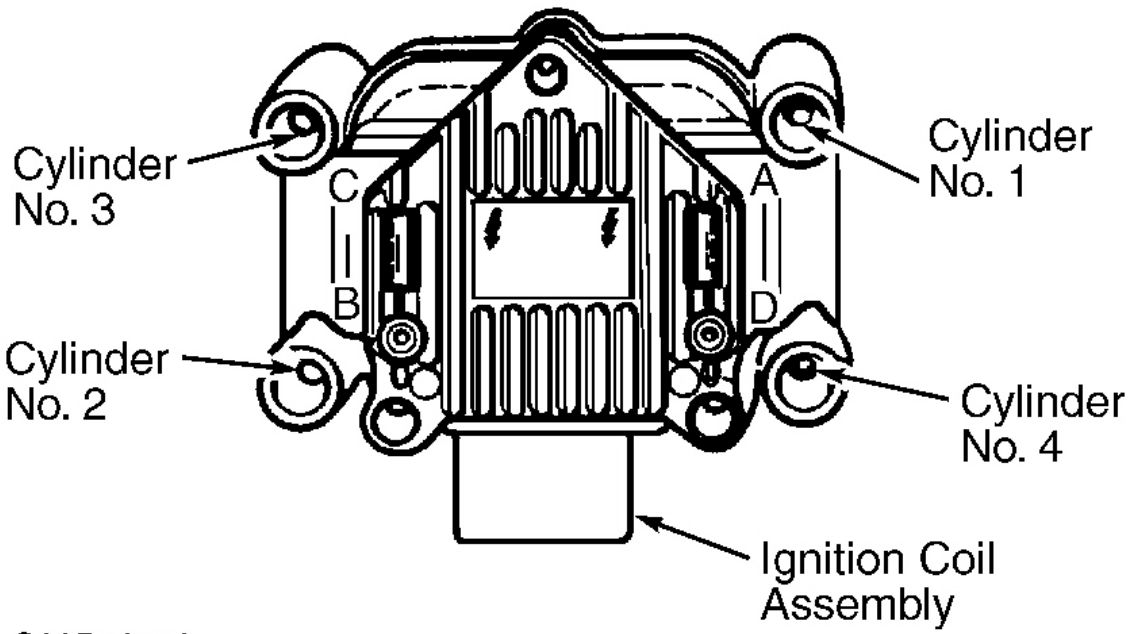

Fig. 1: Identifying Cylinder Numbers On Ignition Coil (Beetle, Golf, GTI & Jetta - 2.0L AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

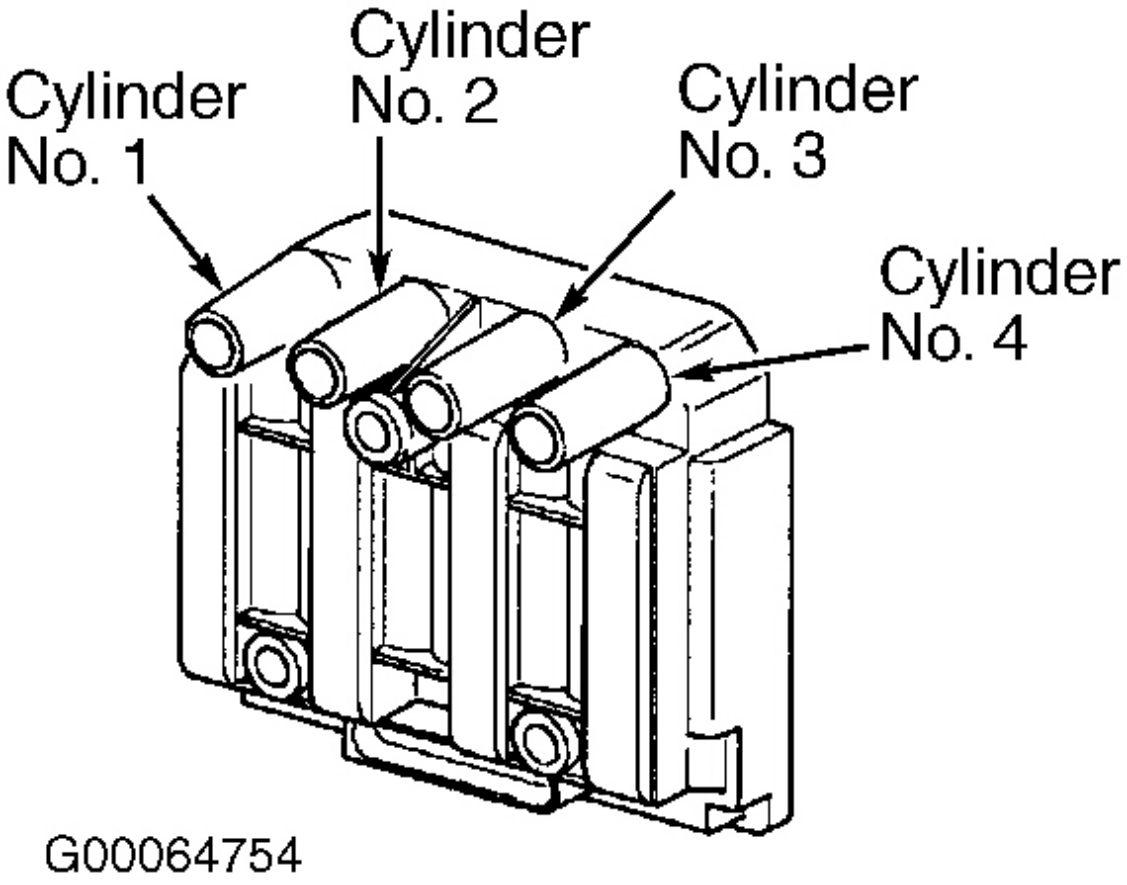

Fig. 2: Identifying Cylinder Numbers On Ignition Coil (Beetle & Jetta - 2.0L AVH & AZG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

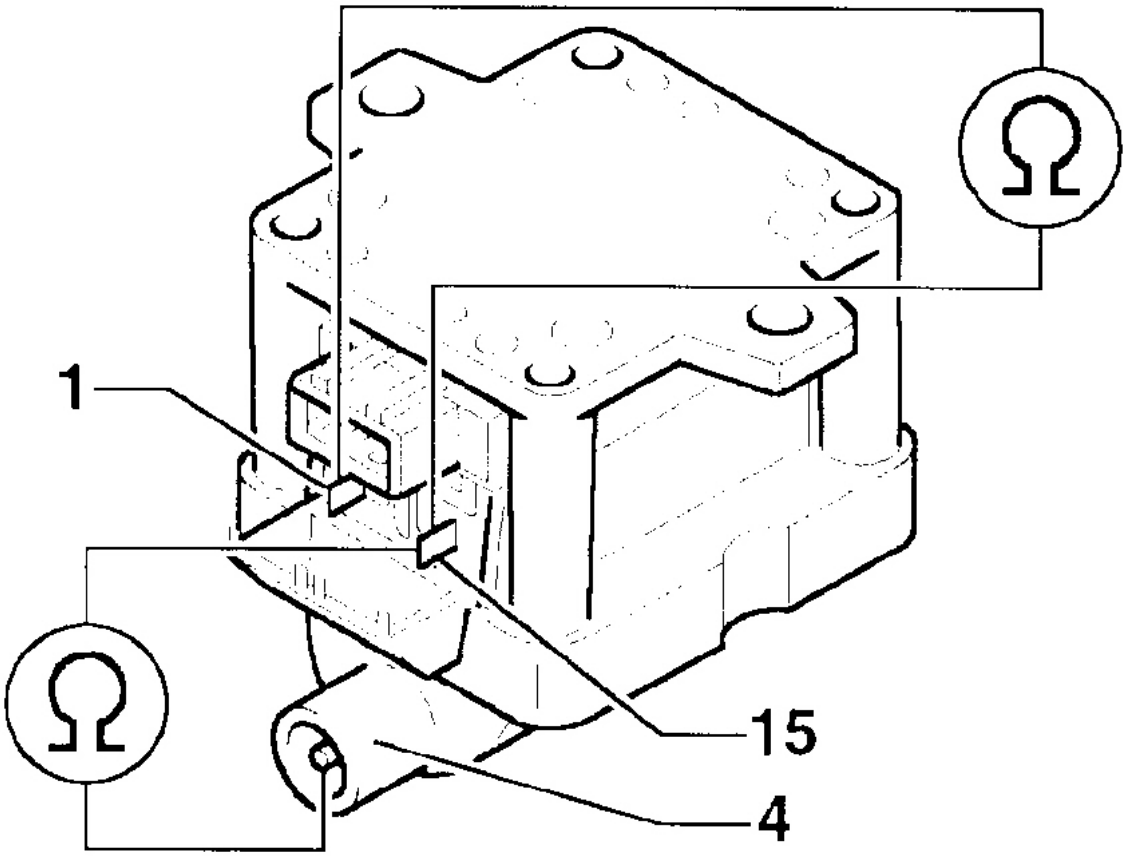

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Fig. 3: Coil Resistance Check (Cabrio)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

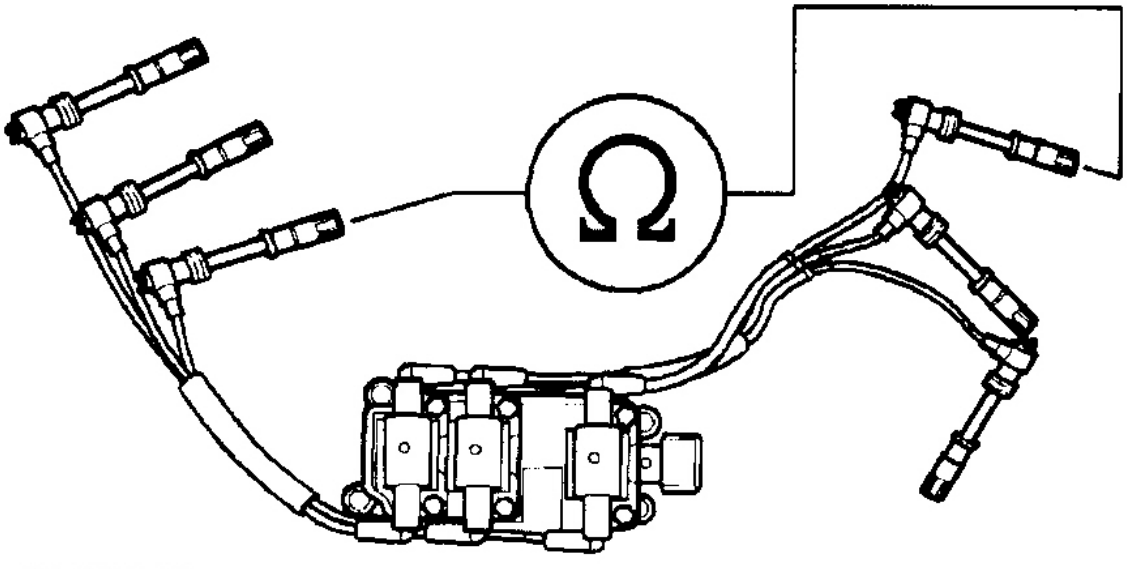

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Fig. 4: Coil & High Tension Wire Resistance Check (Passat - 2.8L ATQ)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: **EuroVan with engine code AXK uses ignition coil on spark plug type ignition system.**

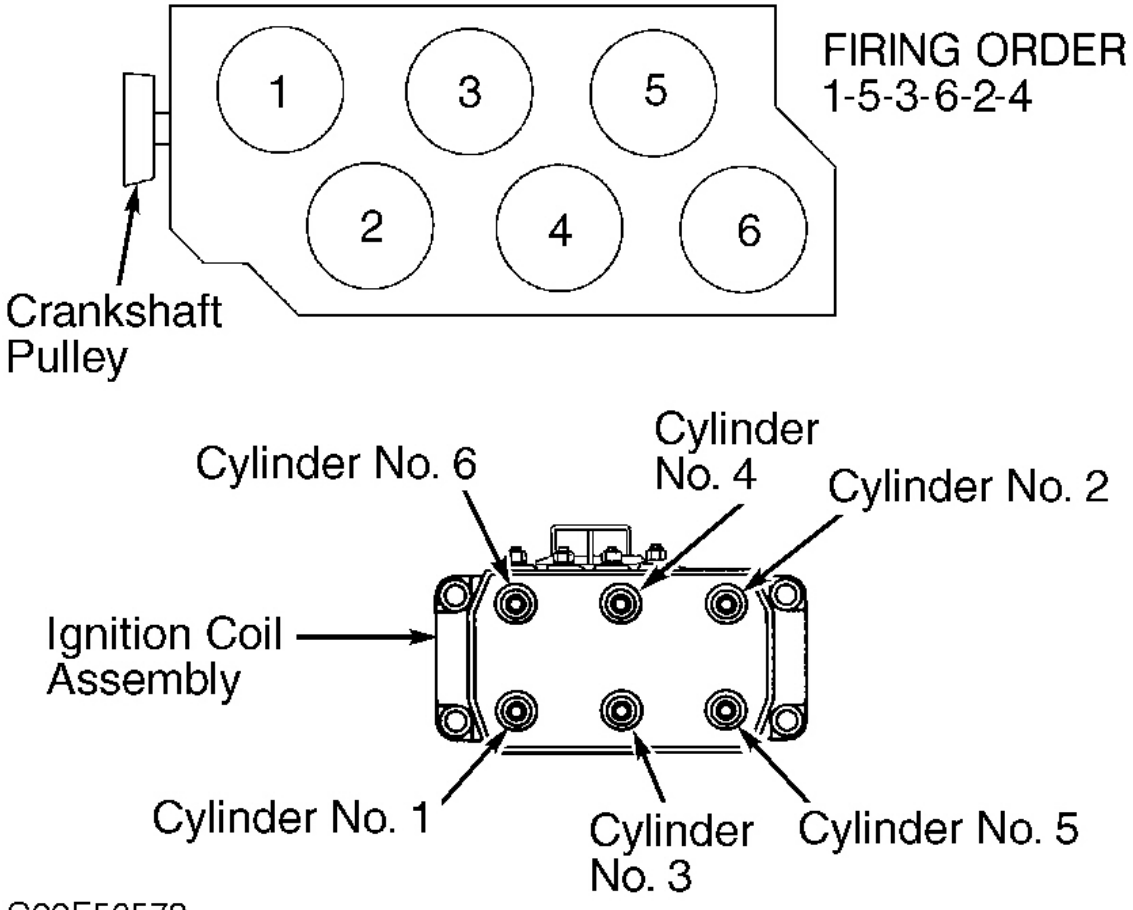

Fig. 5: Identifying Cylinder Numbers & Firing Order (EuroVan - 2.8L, GTI & Jetta - 2.8L AFP)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

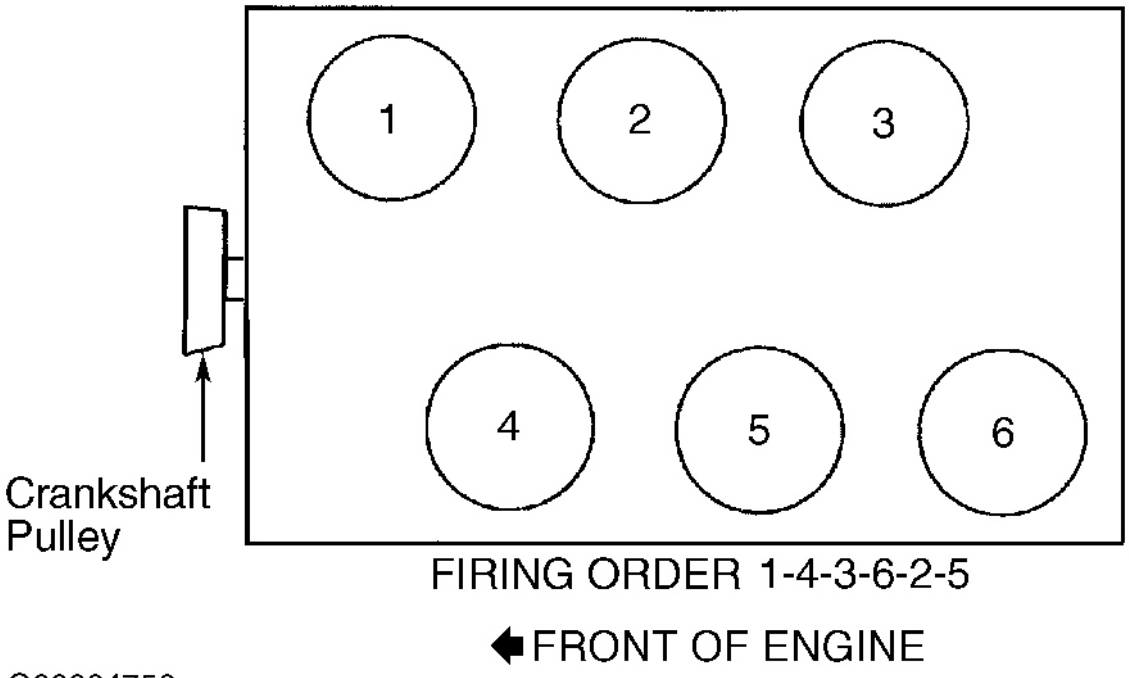

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Fig. 6: Identifying Cylinder Numbers & Firing Order (Passat - 2.8L ATQ)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

IGNITION TIMING

IGNITION TIMING - (Degrees BTDC) (1)

Application	Base Timing	Advance Timing
Beetle 1.8L Turbo & 2.0L	(2)	(2)
Cabrio 2.0L	(3) 0-5	(2)
EuroVan		
2.8L (AES)	(4) 11-13	(5) 0-50
2.8L (AXK)	(2)	(2)
Golf 1.8L Turbo & 2.0L	(2)	(2)
GTI 1.8L Turbo, 2.0L & 2.8L	(2)	(2)
Jetta 1.8L Turbo, 2.0L & 2.8L	(2)	(2)
Passat 1.8L Turbo & 2.8L	(2)	(2)

(1) Manufacturer recommends using Scan Tool (VAG 1551/1552) when checking ignition timing with radiator cooling fan, A/C and all accessories turned off.

(2) Ignition timing is nonadjustable and ignition timing specification is not available from manufacturer.

(3) Specification should be displayed in display field No. 3 on scan tool with engine at 800-880 RPM and display field No. 4 on scan tool should display a maximum of

plus or minus 2 degrees from reading in display field No. 3 with engine at 800-880 RPM. Timing is not adjustable, specifications are for checking ignition timing only.

(4) Specification should be displayed in display field No. 3 on scan tool with engine at 650-750 RPM and display field No. 4 on scan tool should display a maximum of plus or minus 2 degrees from reading in display field No. 3 with engine at 650-750 RPM. Timing is not adjustable, specifications are for checking ignition timing only.

(5) Specification should be displayed in display field No. 3 on scan tool with engine at 650-6000 RPM and display field No. 4 on scan tool should display 0-40 degrees with engine at 650-6000 RPM. Timing is not adjustable, specifications are for checking ignition timing only.

FUEL SYSTEM

FUEL INJECTION PUMP

FUEL INJECTION PUMP TIMING - (Degrees BTDC @ Idle) (1)

Application	Specification
Beetle, Golf & Jetta	
1.9L Turbo Diesel	(2) 7-9

(1) Manufacturer recommends using Scan Tool (VAG 1551/1552) when checking fuel injection pump timing.

(2) Specification should be initially displayed in display field No. 3 on scan tool and then after 10 seconds, display should decrease to 3-5 degrees which is the retarded fuel injection pump timing.

FUEL PUMP

FUEL PUMP PERFORMANCE & REGULATED FUEL PRESSURE

Application	Pressure At Idle psi (bar)	Volume In 30 Seconds (1)	Residual Pressure psi (bar)
Beetle 1.8L Turbo & 2.0L	(2) 36 (2.5)	(3)	(4) 29 (2.0)
Cabrio 2.0L	(2) 36 (2.5)	(5)	(4) 29 (2.0)
EuroVan 2.8L (AES)	(2) 36 (2.5)	(6)	(4) 29 (2.0)
EuroVan 2.8L (AXK)	(2) 36 (2.5)	(3)	(4) 29 (2.0)
Golf 1.8L Turbo & 2.0L	(2) 36 (2.5)	(3)	(4) 29 (2.0)
GTI 1.8L Turbo, 2.0L & 2.8L	(2) 36 (2.5)	(3)	(4) 29 (2.0)
Jetta 1.8L Turbo, 2.0L & 2.8L	(2) 36 (2.5)	(3)	(4) 29 (2.0)

Passat 1.8L Turbo	(7) 51 (3.5)	(6)	(4) 29 (2.0)
Passat 2.8L	(7) 51 (3.5)	(6)	(4) 32 (2.2)

(1) Volume is dependent upon battery voltage and should be checked with battery fully charged. Battery voltage must be monitored when checking the volume. Voltage at fuel pump with engine not running and fuel pump operating is approximately 2 volts less than battery voltage. Volume should vary with battery voltage. See **Fig. 7** -**Fig. 9** .

(2) With vacuum hose disconnected at fuel pressure regulator 44 psi (3.0 bar).

(3) See **Fig. 7** .

(4) Residual pressure is measured 10 minutes after engine or fuel pump is shut off.

(5) See **Fig. 8** .

(6) See **Fig. 9** .

(7) With vacuum hose disconnected at fuel pressure regulator 58 psi (4.0 bar).

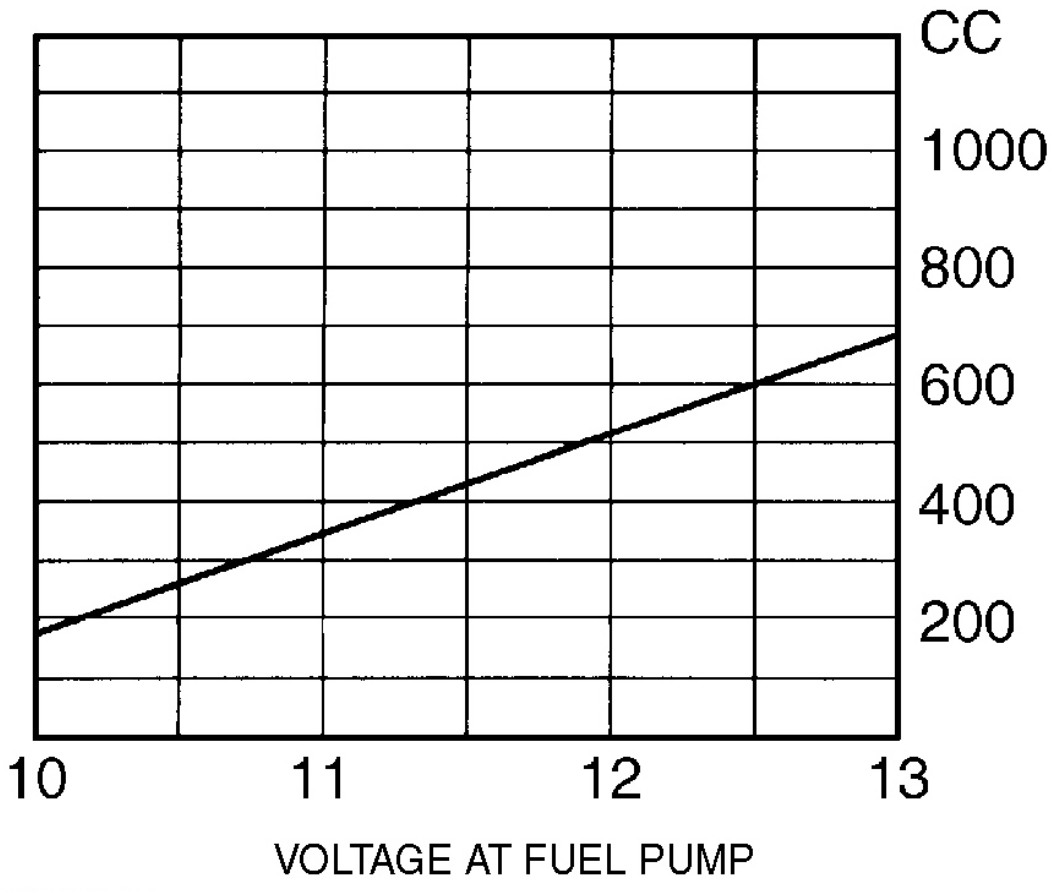

Fig. 7: Determining Fuel Pump Volume (Beetle, Golf, GTI & Jetta - 1.8L Turbo, Beetle, Golf, GTI & Jetta - 2.0L, EuroVan - 2.8L Engine Code AXK, GTI & Jetta - 2.8L)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

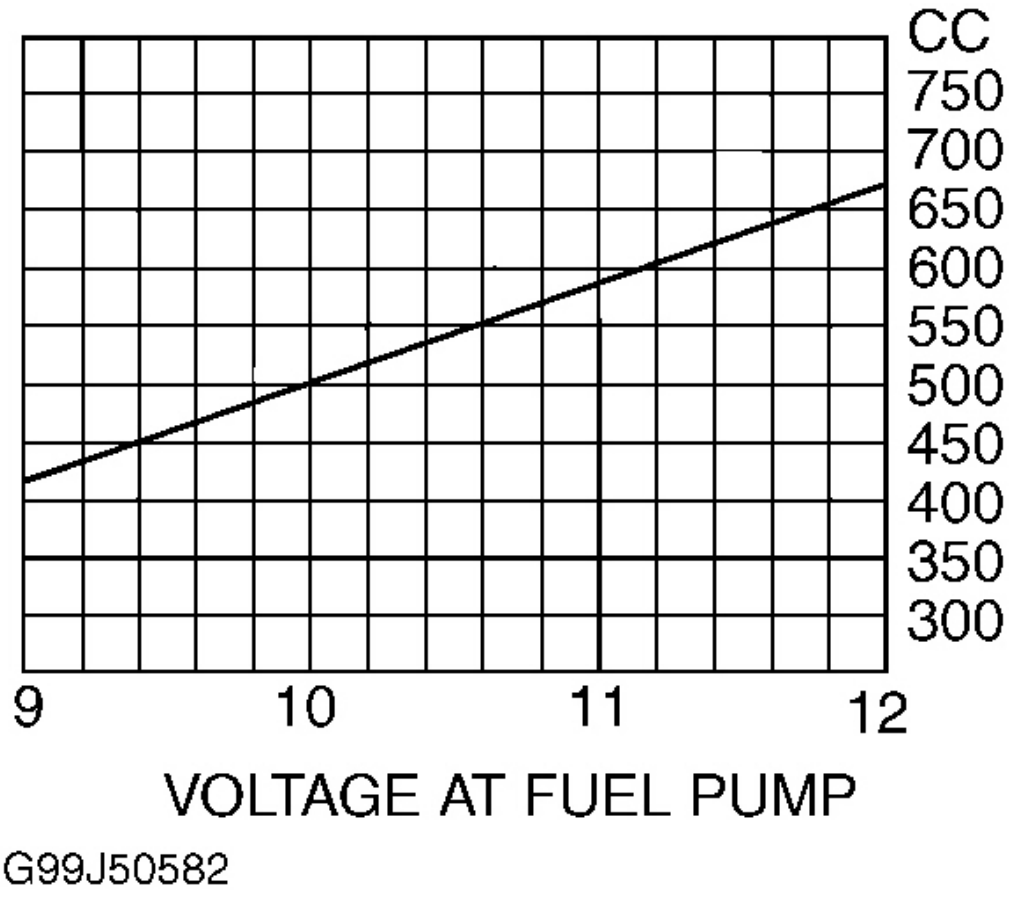

Fig. 8: Determining Fuel Pump Volume (Cabrio - 2.0L)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

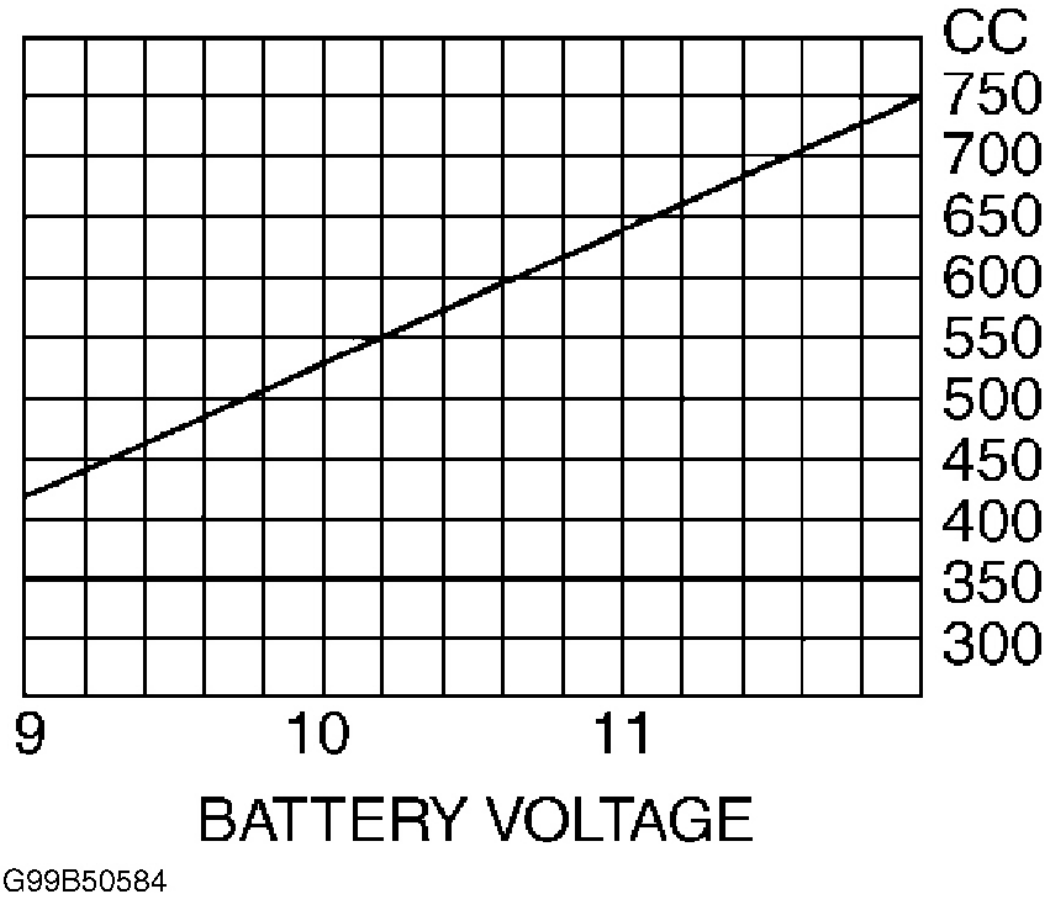

Fig. 9: Determining Fuel Pump Volume (EuroVan - 2.8L Engine Code AES, Passat - 1.8L Turbo & Passat - 2.8L V6)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

INJECTOR RESISTANCE

INJECTOR RESISTANCE SPECIFICATIONS

Application	Ohms
Beetle	
1.8L Turbo	12.0-17.0
2.0L (AEG)	13.5-15.5
2.0L (AVH & AZG)	14.0-18.0
Cabrio 2.0L	14.0-18.0
EuroVan	
2.8L (AES)	15.0-21.5

2.8L (AXK	13.0-19.0
Golf	
1.8L Turbo	12.0-17.0
2.0L	13.5-15.5
GTI	
1.8L Turbo	12.0-17.0
2.0L	13.5-15.5
2.8L	13.0-19.0
Jetta	
1.8L Turbo	12.0-17.0
2.0L (AEG)	13.5-15.5
2.0L (AVH & AZG)	14.0-18.0
2.8L	13.0-19.0
Passat	
1.8L Turbo	12.0-17.0
2.8L	13.5-15.5

IDLE SPEED & MIXTURE

IDLE SPEED & ADAPTATION VALUE (FUEL TRIM) (1)

Application	Idle RPM	(2) Adaptation Value (Fuel Trim)
Beetle		
1.8L (APH)	820-860	(3) -13 To 13%
1.8L (AWV)	640-820	(3) -13 To 13%
2.0L (AEG)	760-880	(3) -10 To 10%
2.0L A/T (AVH & AZG)	790-890	(3) -10 To 10%
2.0L M/T (AVH & AZG)	730-830	(3) -10 To 10%
Cabrio	800-850	(3) -10 To 10%
EuroVan		
2.8L (AES)	650-750	(3) -5 To 5%
2.8L (AXK)	650-750	(3) -10 To 10%
Golf		
1.8L Turbo A/T	640-760	(3) -10 To 10%
1.8L Turbo M/T	700-820	(3) -10 To 10%
2.0L	760-880	(3) -10 To 10%
GTI		
1.8L Turbo A/T	640-760	(3) -10 To 10%

1.8L Turbo M/T	700-820	(3) -10 To 10%
2.0L	760-880	(3) -10 To 10%
2.8L	680-720	(3) -10 To 10%
Jetta		
1.8L Turbo A/T	640-760	(3) -10 To 10%
1.8L Turbo M/T	700-820	(3) -10 To 10%
2.0L A/T (AVH & AZG)	790-890	(3) -10 To 10%
2.0L M/T (AVH & AZG)	730-830	(3) -10 To 10%
2.8L	680-720	(3) -10 To 10%
Passat		
1.8L Turbo	740-920	(3) -10 To 10%
2.8L AWD	620-740	(3) -10 To 10%
2.8L FWD	710-860	(3) -10 To 10%

(1) Manufacturer recommends using Scan Tool (VAG 1551 or 1552) when checking idle speed & Adaptation Value (Fuel Trim). Specifications listed are using Scan Tool (VAG 1551 or 1552. Idle speed and CO level are nonadjustable.

(2) Adaptation Value (Fuel Trim) is displayed in display field No. 3 on scan tool. No CO specifications are available from manufacturer.

(3) When in this range, the value must fluctuate by at least 2 percent at idle.